

CLAIMS:

1. A method of making a genetically transformed plant comprising:

5 A) introducing into a plant cell capable of being transformed and regenerated to a whole plant a DNA expression cassette comprising, in addition to DNA sequences required for transformation and selection in plant cells, a DNA sequence that, under the control of a promoter active in plant cells, encodes a protein capable of modifying the utilization of a
10 substrate in a secondary metabolic pathway, with the proviso that the substrate is not a primary metabolite of the group selected from glucose, amino acids, common fatty acids and nucleotides, and

15 B) recovering a plant which has an altered content of at least one product of the secondary metabolic pathway.

2. A method for making a genetically transformed seed comprising growing the plant obtained according to steps A and B of the method according to claim 1 under conditions which permit the formation of seed.

20 3. The method according to claim 1 wherein the promoter is tissue selective.

4. The method according to claim 3 wherein the promoter is seed selective.

5. The method according to claim 1 wherein the product of the secondary metabolic pathway is an anti-nutritional.

6. The method according to claim 1 wherein the protein is a heterologous enzyme.

7. The method according to claim 1 wherein the encoded protein is an enzyme capable of altering a substrate in the phenylpropanoid pathway whereby at least one product of the phenylpropanoid pathway is altered.

10 8. The method according to claim 4 wherein the encoded protein is an enzyme capable of altering a substrate in the phenylpropanoid pathway whereby at least one product of the phenylpropanoid pathway is altered.

15 9. The method according to claim 7 wherein the encoded protein is a choline metabolizing enzyme capable of acting upon choline to modify the use of choline by other enzymes in the phenylpropanoid pathway.

20 10. The method according to claim 9 wherein the choline metabolizing enzyme is choline oxidase, and wherein the choline oxidase encoding DNA sequence is under the control of a seed-selective promoter active in plant cells, and wherein the DNA expression cassette additionally comprises a DNA sequence that encodes betaine aldehyde dehydrogenase capable of acting

upon betaine aldehyde converting it to betaine, said betaine aldehyde dehydrogenase encoding DNA sequence being under the control of a seed-selective promoter active in plant cells.

11. The method according to claim 7 wherein the encoded protein is ferulic acid decarboxylase.

12. The method according to claim 1 wherein the encoded protein is an enzyme capable of acting upon a sugar alcohol.

13. The method according to claim 4 wherein the encoded protein is an enzyme capable of acting upon a sugar alcohol.

14. The method according to claim 12 wherein the encoded protein is an enzyme capable of acting upon myo-inositol.

15. The method according to claim 4 wherein said seed selective promoter is selected from the phaseolin promoter and the napin promoter.

16. A genetically modified plant seed with reduced sinapine content prepared according to the method of claim 8.

17. A genetically modified plant seed with altered phenolic content prepared according to the method of claim 13.

18. A genetically modified plant with altered lignin content prepared according to the method of claim 7.

5 19. A genetically modified plant seed with altered sugar alcohol content prepared according to the method of claim 13.

20. A genetically modified plant seed with reduced phytate content prepared according to the method of claim 13.

SECRET 10 21. DNA vector pHS 731. A

22. DNA vector pHS 981.

23. DNA vector pGS97b1.

24. DNA vector pSIMT.

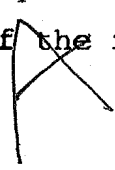
25. DNA vector pNIMT.

15 26. A DNA vector containing a gene selected from the COX gene, the BADH gene, the IMT gene and the ferulic acid

decarboxylase gene, under the control of the phaseolin promoter.

27. A plant prepared by the method of claim 1, wherein the plant is selected from *Dicotyledoneae* and
5 *Monocotyledoneae*.

28. A plant prepared by the method of claim 1, wherein said plant is selected from members of the families *Malvaceae*, *Linaceae*, *Compositae*, *Fabaceae*, *Euphorbiaceae*, *Gramineae* and *Oleaceae*.

10 29. A plant prepared by the method of claim 1, wherein said plant is a member of the family *Brassicaceae* (= *Cruciferae*). 

30. A plant prepared by the method of claim 1, wherein said plant is selected from members of the genus *Linum*,
15 *Gossypium*, *Glycine*, *Arachis*, *Carthamus*, *Helianthus*, *Medicago*, *Sinapis*, *Raphanus*, *Ricinus*, *Olea*, *Zea*, *Hordium*, *Triticale*, and *Oryza*.

31. A plant prepared by the method of claim 1, wherein said plant is a member of the genus *Brassica*.

20 32. A plant prepared by the method of claim 1, wherein said plant is *Brassica napus* or *Brassica rapa*.

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33. A feed product comprising seed or meal derived therefrom wherein the seed is prepared according to the method of claim 4.

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